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DIV. 35

USES OF STERILAMPS IN REFRIGERATED DISPLAY CASES

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The WESTINGHOUSE STERILAMP* AND THE RENTSCHLER-JAMES PROCESS

Prior to the development of the STERILAMP practically all of the ultra-violet generators available were unsuitable for use as bactericidal agents because of the characteristics of the radiations they produced. Their output covered broad, rather than selective wave bands. Thus much of their energy was consumed in producing radiations which were either useless for the required purpose or definitely detrimental in effect. Because they were low in efficiency in converting electric power into bactericidal energy they operated a high temperature, gave copious output in the infra-red and visible region and, in many cases, produced high concentrations of ozone and nitrous oxide.

The high temperatures at which they operated made their use in refrigerated spaces impractical and costly. In other instances the accompanying infra-red radiation adversely affected the material to be sterilized. Further, because of the heat generated by these sources, relatively long distances had to be maintained between the source and the material to be sterilized, which resulted in a substantial decrease in effectiveness of the shorter and highly bactericidal radiations.

The ozone concentrations produced by these sources not only were toxic in their effect upon human beings and therefore a definite hazard, but also

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Harvey C. Rentschler, A. B., M. A., PH. D. Director of Research, Westinghouse Lamp Division, has been named, by Dr. E. E. Free, one of the world's ten greatest living scientists. His researches in the fields of photo-electric cells and ultra-violet radiation have earned him world-wide fame and made possible the development of the Sterilamp.

Robert F. James, M.E., M.D., Bio-Physicist has been engaged in the development of germicidal ray devices since his connection with the Westinghouse laboratories in 1933. His researches in the treatment of food stuffs and the prevention of infection in the medical field thru the use of ultra-violet radiation is the basis of the Rentschler-James Process.

adversely affected many of the materials to be sterilized, such as meat, liquid foods, etc.

In addition, because of their inefficiency, these generators were too expensive to operate for many of the purposes where a suitable sterilizing agency was most urgently needed and particularly where continuous operation was necessary.

Thus the problem which presented itself was a dual one. First, the development of a generator of bactericidal ultra-violet energy, high in efficiency, low in cost and temperature of operation and one which produced minimum ozone concentrations. Secondly, the development of processes for applying the radiation to obtain the desired result effectively, economically and without the adverse effects which had previously accompanied the use of ultra-violet when used as a sterilizing agent.

After five years of experimental and research work, Dr. Harvey C. Rentschler, Director of Research, Westinghouse Lamp Division, and his associate, Dr. Robert F. James, Staff Bacteriologist, succeeded in designing a lamp which met these requirements. This lamp has been named the Westinghouse STERILAMP* and is now commercially available.

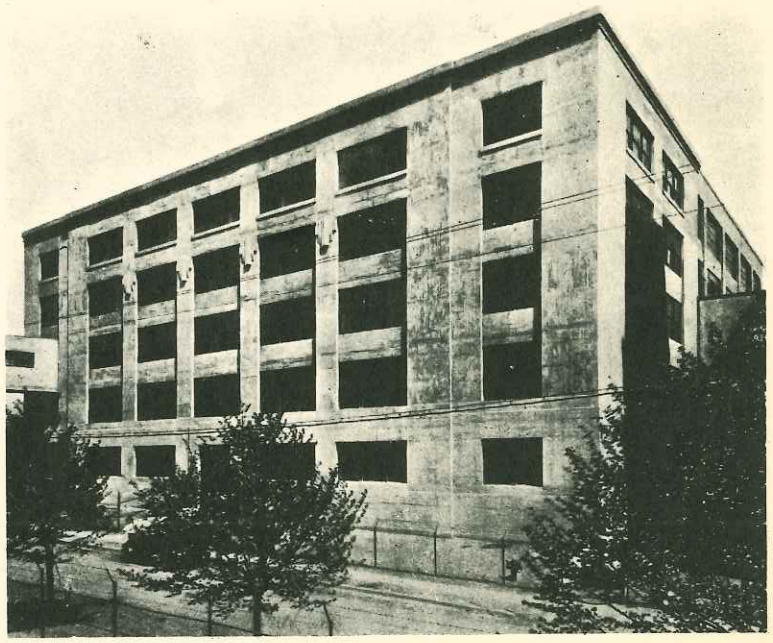
WHAT IS THE RENTSCHLER-JAMES PROCESS?

After the STERILAMP had been proved to be an effective instrument for producing bactericidal ultra-violet radiation, Dr. Rentschler and Dr. James studied the many ways in which it could be put to practical use.

The facts developed out of their research in this field formed a basis for the Rentschler-James Process or "Rentschlerizing" and now, just as Pasteurization is known as a means of sterilizing through the use of heat, so the Rentschler-James Process or "Rentschlerizing" is known as a means of sterilizing through the use of selected ultra-violet radiation.

The uses to which this process can be put are many and varied. Because it is effective and inexpensive to install and operate, new uses are being discovered daily. At the present time, however, four broad general types of application seem to hold the greatest immediate possibilities. These are: 1. In Meat Refrigerators and Show Cases; 2. In the sterilization of drinking glasses and utensils used in public places; 3. In Bakeries; 4. In Hospitals.

From the research laboratories of the Westinghouse Lamp Division in Bloomfield, New Jersey, have come many important and far-reaching discoveries, among them the development of the Rentschler-James Process of sterilization thru ultra--violet radiation.



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USES OF STERILAMPS IN REFRIGERATED DISPLAY CASES

STERILAMPS in refrigerated display cases have the same beneficial effect as in refrigerators when the essential requirements of air circulation, high humidity and moderate temperature are provided. The temperature of the case may be raised to 50°F., which will materially reduce the cost of refrigeration. High humidity may be maintained because of higher temperature and decreased frosting of the coils. This radical change in operating conditions brought about through the use of STERILAMPS will provide the following benefits: 1. Improved appearance of meat and meat products, resulting in increased sales. 2. Retention of freshness of perishable foods, such as chicken loaf, chopped meat, sausage, cottage cheese, etc. 3. Reduction of trimming losses due to dehydration of cut surfaces. 4. Reduction of odor usually present when a variety of products is displayed. 5. Elimination of daily emptying and re-dressing of the case. 6. Sterility and cleanliness of the case, resulting in more effective customer appeal. 7. Reduced refrigerating cost.

HOW TO INSTALL STERILAMPS IN DISPLAY CASES

Refrigerated display cases are of many designs and constructions with

wood, metal or glass tops and wood or metal frames. The most convenient position for STERILAMPS is in the upper front corner of the case with the lamp parallel to and as near the corner as the construction of the case will permit. It is desirable to have the lamps visible to the customers through the glass front. One 30" STERILAMP is necessary for each four to six feet of display case length. The STERILAMPS are centered in the section.

The STERILAMPS may be supported in wood top cases by screwing the fittings directly to the wood. Where there is a glass top and glass front, it may be necessary to insert a thin supporting strip and bend it down over the edge of the front glass. The STERILAMP fitting is then fastened to this supporting strip, Fig. 1. Where the cooling coil is in the top of the case, the supporting strip may be clamped over the edge of the drip pan, Fig. 2, or screwed to the frame of the case above the glass front, Fig. 3.

Wires may be run in small thin-wall metal conduit up on one end of the case through the STERILAMPS in series and down the opposite end. If two cases are adjacent, the wire to the lamps may be run through the adjoining ends of the display cases so that up to four lamps may be operated from one transformer or power unit. The power unit is usually installed outside the case near one end. In display cases which have a non-refrigerated space at the bottom, the power unit may be placed in this space where it is out of sight, yet may be reached readily for starting the STERILAMPS.

COST OF STERILAMP INSTALLATION IN DISPLAY CASES

For retail store display cases, one 30" STERILAMP is required for each 4'-6' of display case length. The cost of material for a one-lamp installation is approximately $50.00 and for larger cases approximately $20.00 additional for each STERILAMP up to four.

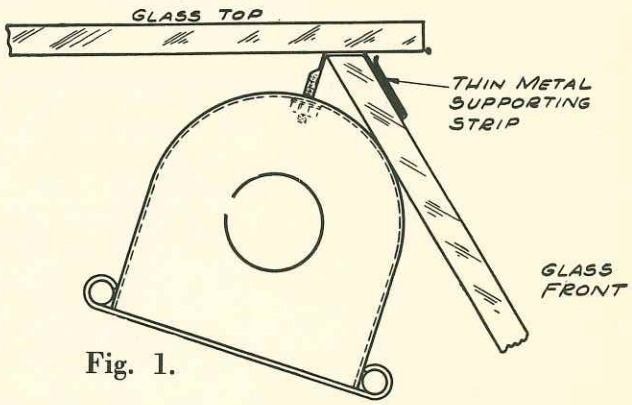


Fig. 1.

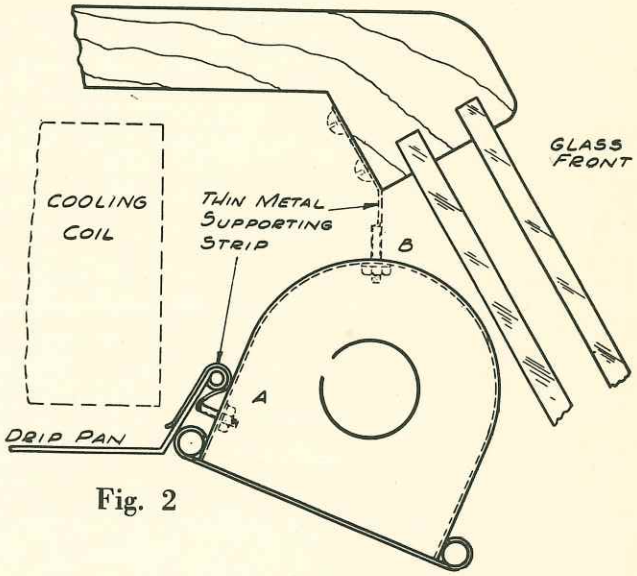


Fig. 2

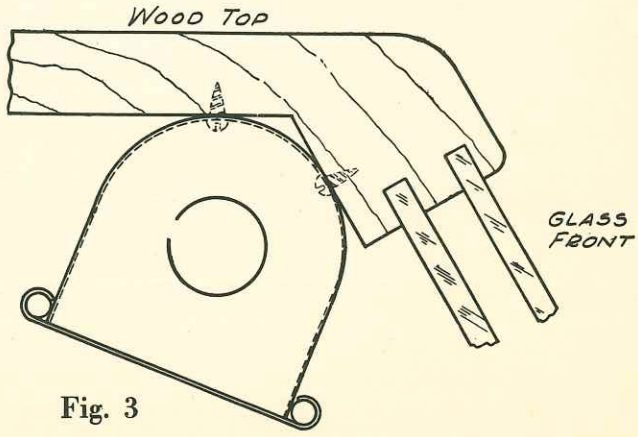
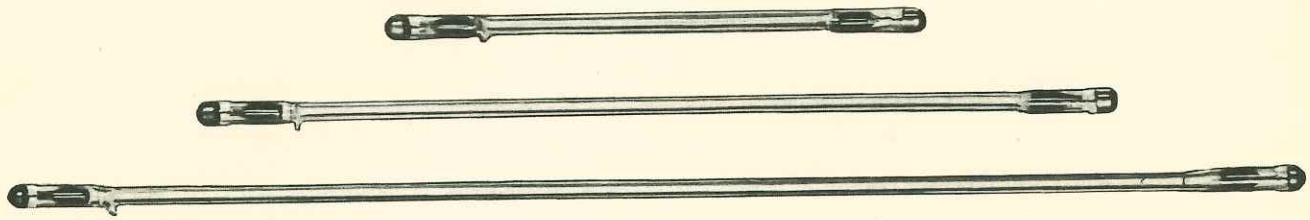


Fig. 3

WESTINGHOUSE
STERILAMPS
AND EQUIPMENT



In appearance the Westinghouse Sterilamp is a slender rod shaped glass tube, flaring slightly at each end where the electrodes are located. They operate on the gaseous discharge principle in an atmosphere of inert gases and mercury vapor.

Over 80% of the radiant energy produced by the STERILAMP is in the region of 2550 Angstrom Units, which provides the most effective bactericidal energy for the power consumed.

They operate only on alternating current through the medium of current regulating transformers. STERILAMPS should always be connected in series, never in parallel. It is recommended that a protective relay and starting switch be provided.

The STERILAMP will operate in any position and have an effective life of six months. It is available in three lengths and a complete line of fixtures, sockets and specially designed operating equipment is available.

STERILAMPS will not normally burn out or fail to light, but will lose their effectiveness through discoloration which absorbs the ultra-violet radiation. This discoloration occurs gradually when they are burned at room temperature (70°F) and more rapidly at lower temperatures. They should never be operated at temperatures below 40°F. Under normal conditions an effective life of six months of continuous operation may be expected.

STERILAMP CHARACTERISTICS

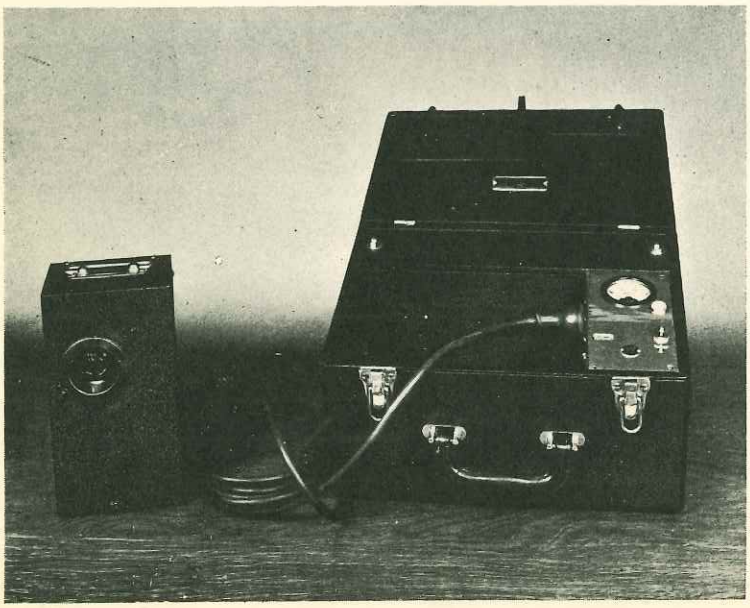
	WL-782-10	WL-782-20	WL-782-20	
Overall lengths	14⅝	24⅝	34⅝	Inches
Effective Lengths	10	20	30	Inches
Maximum Diameter	⅞	⅞	⅞	Inches
Starting Voltage—a.c.	400	575	750	Volts
Operating Voltages—a.c.	275	375	475	Volts
Operating Current (approx.)	.030-.050	.030-.050	.030-.050	Amp.
Effective life	6 months	6 months	6 months	

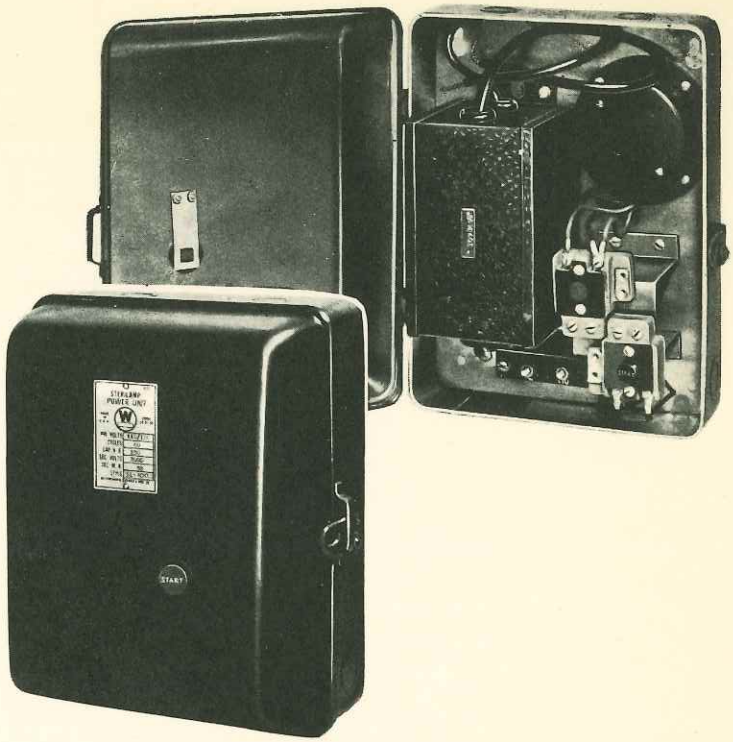
MEASUREMENT OF STERILAMP RADIATION

The Westinghouse portable ultra-violet meter model #SM200 has been especially developed for the measurement of radiation from the STERILAMP. The heart of the meter is a phototube which is responsive only to wave lengths in the bactericidal portion of the ultra-violet spectrum. The device is packed in a carrying case and it is entirely self contained. The total weight, is approximately 22 pounds.

In measuring the radiation from the STERILAMP, the unit is set up with the phototube housing in a position to receive the radiation. After noting the reading on the counter mechanism, the meter is allowed to operate for a definite time. By noting the number of impulses recorded on the meter during the observed time, a relative evaluation of the ultra-violet intensity is obtained.

Since no unit of intensity of ultra-violet radiation has been standardized and no standard source of ultra-violet has yet been established, these meters are calibrated in numbers of clicks required to kill B. Coli.

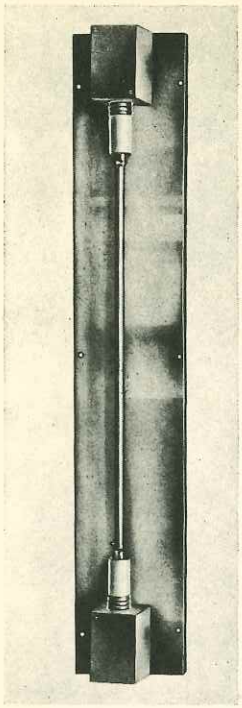




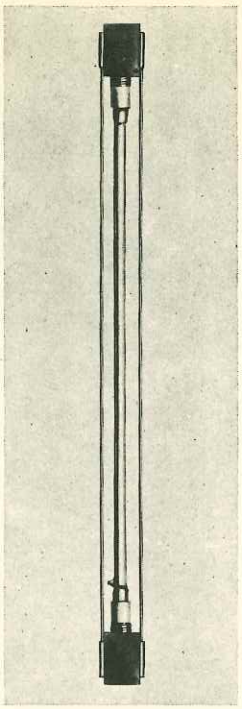
POWER UNIT — TYPE SL-100

This power unit is specially designed for operating STERILAMPS. It consists of a transformer, relay, starting button and a safety door switch — all enclosed in a metal housing. Suitable conduit knockouts are provided for insertion of standard metal conduit carrying the supply leads and high voltage leads. The relay in the power unit is provided for safety and will open the primary circuit of the transformer if a lamp is removed or broken. The relay is closed automatically by depressing the starting button provided on the cover of the power unit. Each power unit is capable of operating 1 to 4 — 30″ STERILAMPS, 1 to 5 — 20″ STERILAMPS, and 1 to 6 — 10″ STERILAMPS, from any 60 cycle supply voltage between 110 and 120 volts a.c.

Where STERILAMPS are installed in special radiation chambers or in air ducts having inspection doors with the usual safety switch requirement, the relay in the power unit is not required. Single transformers are available for these installations.



SB-30



SC-30

FIXTURES

Two types of fixtures, specially designed for use with STERILAMPS are available.

Types SB-30, SB-20 and SB-10 are equipped with flat reflectors and are suitable for use in walk in refrigerators, bakeries and other places where ceiling or wall mountings are specified. These complete units include sockets, terminal boxes and reflectors.

Types SC-30, SC-20 and SC-10 are open type fixtures, specially designed for use in refrigerated show cases. They come complete with sockets, terminal boxes and necessary hardware for attaching.

SEPARATE ACCESSORY PARTS

In cases where the standard fixtures or power unit is not required separate component parts are available, including underwriter's laboratory approved STERILAMP sockets LD-75, current regulating STERILAMP transformer ST-90 and Safety Relay SR-80. Where special reflectors are required, Alzac finished aluminum in either specular or mat finish is recommended.

STERILAMP WIRING

The open circuit voltage of the STERILAMP power unit is 3000 volts. All wiring between the power unit and the STERILAMP should therefore be in accordance with the National Electrical Code for "Signs and Outline Lighting—Exceeding 600 Volts". (See National Electrical Code Article 600). Cable should be an approved type insulated for 5000 volts.

CAUTION

STERILAMPS are not intended for treatment of the human body. The ultra-violet radiation from these lamps is harmful to the eyes even under conditions of relatively short exposure. These radiations may also cause mild erythema (reddening) of the skin when exposed to them for too long a time.

The lamps must be installed and operated only under conditions which provide adequate protection for the eyes and which minimize as much as is practically possible the direct exposure of the skin.

Goggles (either clear or colored glass) or other sufficient eye protection such as eye shades should be used when lamps are operated openly in a room. Ordinary forms of clothing and practically all closely woven textiles are adequate protection for the skin.

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